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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/924,199	08/07/2001	Parvathanathan Subrahmanya	010196	1136
23696	7590	09/05/2006	EXAMINER	
QUALCOMM INCORPORATED			BOCURE, TESFALDET	
5775 MOREHOUSE DR.			ART UNIT	
SAN DIEGO, CA 92121			PAPER NUMBER	
			2611	

DATE MAILED: 09/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/924,199

Applicant(s)

SUBRAHMANYA ET AL.

Examiner

Teshfaldet Bocure

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 1-3,7-22 and 30 is/are allowed.
- 6) ☐ Claim(s) 4,5,23,24 and 26-28 is/are rejected.
- 7) ☐ Claim(s) 6,25 and 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 23 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by **Hyuk et al., Hyuk** hereinafter (IEEE publication, “An Adaptive Channel Estimation Scheme for DS-CDMA System,” of a record).

Hyuk teaches a receiver for adaptively estimating the channel characteristics of the received signal comprising: an adaptive filter (see figure 1) for filtering the pilot signal using a minimum square error (see equation 8); and driving the filtering coefficients which maximizes the signal-to-noise- ratio as in claims 23 and 24. the minimum-square –error calculation in equation 8 is a function of the received pilot signal and that of the noise (error), claimed predicted error.

The pluralities of filter coefficients are inherently performed concurrently according to the received pilot signal as in claim 24.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 4,5, 26-27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hyuk et al.**, **Hyuk** hereinafter (IEEE publication, "An Adaptive Channel Estimation Scheme for DS-CDMA System," of a record).

Hyuk teaches a receiver for adaptively estimating the channel characteristics of received signal comprising: an adaptive filter (see figure 1) for filtering the pilot signal using a minimum square error (see equation 8); and updating the filtering coefficients, claimed selecting, which maximizes the signal-to-noise- ratio as in claims 4,5 and 26-28.

Hyuk shows in the equation 8 that the optimal coefficient is minimized as a function of the input signal ($p(n)$) and noise variance (claimed error) in order to maximize the signal-to-noise ratio, however fails to explicitly show that the pilot energy and the noise energy are calculated separately as in claims 4,5 and 27 . Therefore it would have been obvious to one of an ordinary skill in the art to calculate the signal power of the received pilot signal and that of the noise in order to optimize the filtering coefficients in order to generate good channel estimation at the time the invention was made.

Hyuk shows in equation 8 that the optimal coefficient is minimized as a function of the input signal and that of the noise variance, however fails to show that a controller unit as coupled to the filter and operative to estimate the characteristics of the communication channel as in claims 26 and 28. Such a control unit for performing

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channel estimation and for selecting the filtering coefficients instead by the filter itself shown in figure 1 has a final functional equivalent output. Therefore, it would have been obvious to one of an ordinary skill in the art to implement a control unit in the system of **Hyuk** for generating filter coefficients according to the channel characteristics at the time the invention was made.

Allowable Subject Matter

4. Claims 1-3,7-22 and 30 are allowed.
5. Claims 6 and 25 are would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
6. The following is a statement of reasons for the indication of allowable subject matter: The claimed subject matter in claims 1-3,7-22 and 30 is allowable because the arts of record fail to teach or fairly suggest the claimed:

“A method for genenerating pilot estimates indicative of a response of a communication channel between a transmitter unit und a receiver unit comprising: estimating one or more characteristics of the communication channel based on the received pilot a received pilot symbols; and filtering the received pilot symbols in accordance with a particular pilot filter response to provide filtered pilot symbols that comprise: the pilot estimate, wherein the particular pilot filter response is selected from among a plurality of possible pilot tilter response associated with a **plurality of different**

bandwidths based on the one or more estimated channel characteristics (see

starting paragraph.[0057]- to- [0059] as in claims 1,19,20”;

“A method comprising:

filtering received pilot symbols in accordance with a particular filter response to
provide filtered pilot symbol;.

for each received pilot symbol, **using an immediately prior filtered pilot symbol as a
predicted pilot symbol for the received pilot symbols;**

for each received pilot symbol. determining a predication error between the received
pilot symbol and the predicted pilot symbol: and

selecting the particular filter response from among a plurality of possible filter responses
based on one or more prediction errors for one or. more received pilot symbols,” as in
claim 9; and

“in combination of the claimed finger, first, second channel, filtering the pilot signal and
demodulating the received data using g the filtered pilot symbols” as in claim 30..

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to
applicant's disclosure. US patent number 6,430,214 issued to Jalloul et al. discloses a
receiver for filtering the received pilot signal and demodulating the received data
according to the filtered pilot signal..

Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Tesfaldet Bocure whose telephone number is (571) 272-

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3015. The examiner can normally be reached on Mon-Thur (7:30a-5:00p) & Mon.-Fri (7:30a-5:00p).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti (Jay) Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

T.Bocure

Tesfaldet Bocure
Primary Examiner
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